

Double your memory and double your fun—with a simple modification and the flick of a switch.

## Casio CZ-101 Memory Expander

BY SCOTT MORGAN

Although the CZ-101 memory cartridge supports 32 positions, with the stock CZ only 16 are implemented (this same RAM cartridge is used in Casio's CZ-5000, which does support 32 positions). This modification provides a bank select function to double the RAM cartridge memory capacity from 16 to 32 positions. The mod installs in the CZ-101 itself and requires no modification to the actual RAM cartridge. This technique should also be applicable to the CZ-1000.

### HARDWARE REQUIREMENTS

The first consideration is installing a "bank select" switch on the CZ's body. A standard SPDT toggle switch can be mounted on the CZ's plastic housing, or

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better yet, use the existing "Automatic Power Off" (APO) switch. (Note: if you use this switch for bank select, you will have to permanently enable or disable the APO feature. If you use an external power adapter exclusively, you don't give up anything by disabling the APO.) You will also have to wire an electronic inverter to the cartridge chip select line and the bank select switch; the easiest solution is to incorporate an unused inverter from the CZ's existing circuitry. The only other part required is a few feet of very light gauge wire—wire wrap type is recommended. You'll need to cut a few traces and solder a few wires, and if you're not going to use the existing Auto Power Off switch, you will have to drill a hole and install your own bank select switch in the CZ's housing.

If any of the above sounds even remotely beyond your skills, don't attempt this mod. You are going to be voiding your warranty, and service centers often don't look kindly upon modified gear. But if you think you can do the job right, then let's go.

### INSTALLATION

1) Unplug the CZ, place it face down on a soft surface free of static electricity (for instance, the carpet is an unacceptable static-free surface), remove the RAM cartridge, and remove the batteries if you are using them. Then with the keyboard facing towards you, remove the two Phillips head screws in the battery compartment and remove the remaining 11 screws on the bottom side of the CZ. Carefully remove the plastic bottom housing and set it aside to your left. There are two wires from the battery compartment which you can leave attached.

2) Now orient yourself with the M4152-MAIM circuit board, cartridge port, and Auto Power Off switch. Refer to **Fig. 1**. Locate pin 6 of the JD connector (26 pins in all) near the cartridge port. If you are looking at the bottom side of the circuit board with the cartridge port away from you and the pitch bend wheel in the upper right corner, then pin 6 is counted from the right side of the JD connector. Follow the trace an inch or so until it comes to a solder pad. A jumper connects this pad to the solder pad directly to the right (called point A in **Fig. 2**). Cut the trace near the first solder pad (the one that is closest to pin 6 of the cartridge port) and scrape away some of the green solder mask from the trace leading to the JD connector. You will later be soldering this point to the "output" of the bank select switch.

3) Next locate pin 11 of the 74HC04 IC. This pin is  $4\frac{1}{8}$ -inches from the right

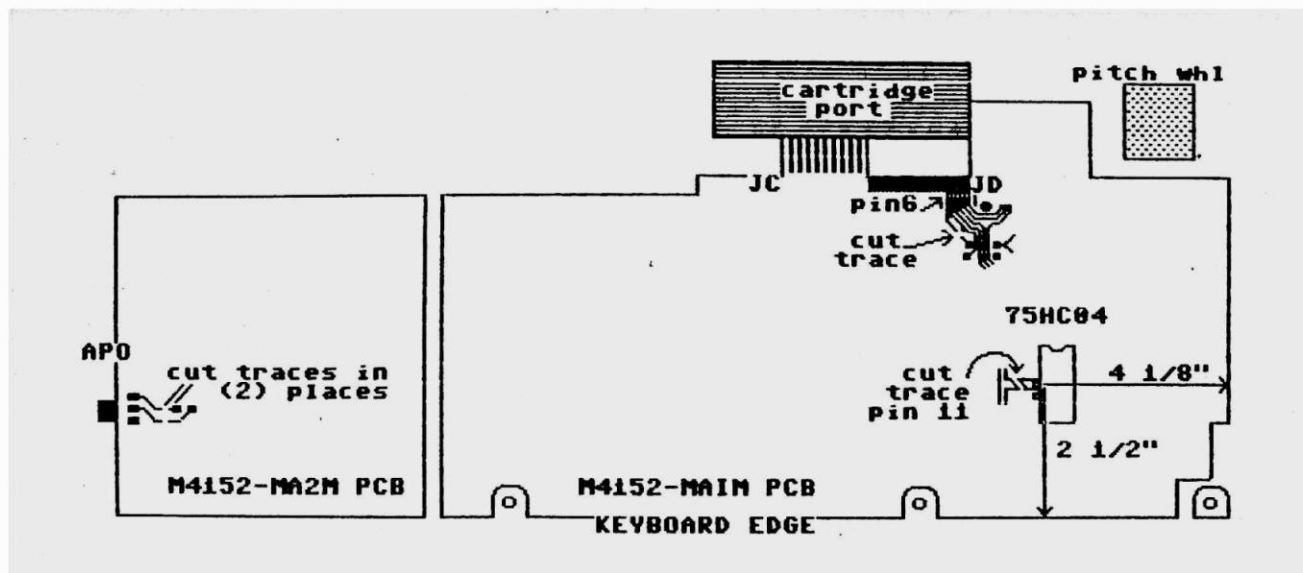


Fig. 1

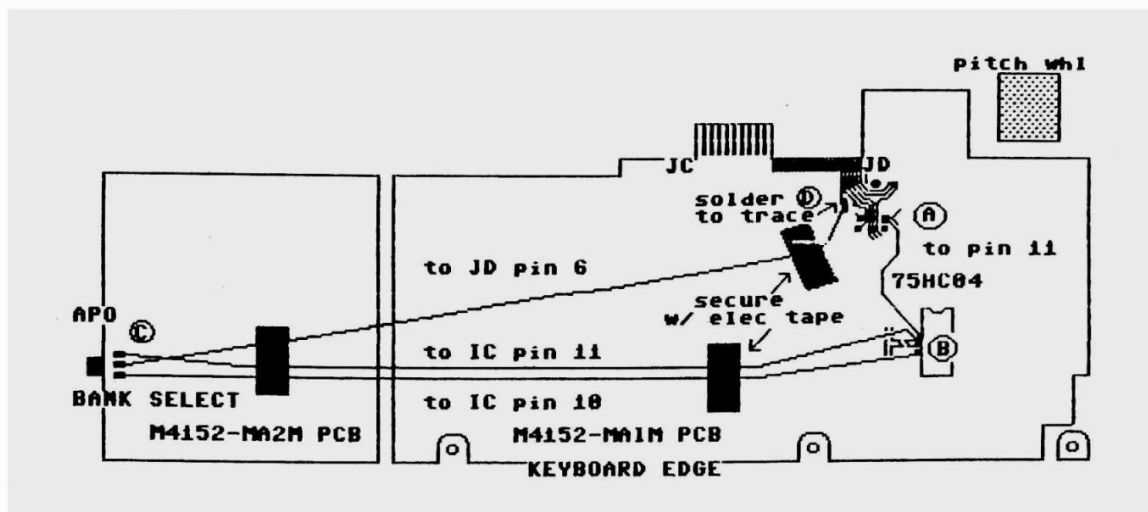


Fig. 2

edge of the circuit board and 2½-inches up from the bottom (keyboard) edge. You will see a fairly thick trace coming from pin 11 and out to the left. Bear in mind that when looking at the bottom of the IC like this, pin 1 is in the upper right hand corner. Cut the thick trace going to pin 11. Pin 10 has no traces and does not connect to anything.

4) Now comes the bank select switch. For those using the existing APO switch, note that it has three terminals, and traces connect to two of them. Cut both traces as shown in Fig. 1. You must now decide whether you want to permanently disable or enable the Automatic Power Off switch. To disable, leave the traces as they are (unconnected). To enable, short together

the two solder pads that formerly connected to the two switch terminal ends.  
5) Referring to Fig. 2, run a wire from point A (mentioned previously in Step 1) to Pin 11 of the 74HC04 IC (point B). Connect another wire to Pin 11 (point B) of the 74HC04 IC; the other end goes to one side of the bank select switch (point

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C). Run a wire from Pin 10 of the 74HC04 IC (located near point B) to the other side of the bank select switch.

6) Hook up a wire from the bank select switch center terminal to pin 6 of the JD connector (point D). This is the trace

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*“...you can now load  
16 extra programs into  
BANK B of the RAM  
cartridge and double  
your fun”*

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where you previously cut and scraped away the solder mask. You must not use too heavy a gauge wire here as there is very little trace to which the solder can bond. Be extremely careful and secure the wire with electrical tape when completed.

7) Secure other long wire runs with electrical tape and inspect your work closely (don't skimp on the quality control!). Replace the bottom housing and replace all screws (don't forget the two screws in the battery compartment). Do not attempt to insert the RAM cartridge without the bottom housing secured, as the housing forms an integral guide for the cartridge.

## TESTING, TESTING

Apply power to the CZ and monitor the audio output. The unit will come up on the Internal presets. Select one of your cartridge presets. If there is no sound, probably the empty “B” bank is enabled. Flip the bank select switch and select a different number preset. Note, however, that there is one slight quirk to the system. In order for a new memory position to be recognized after the bank has been changed, a different preset number must be selected. If you are on, for example, CART 2 BANK A preset and flip the bank select switch, the original sound remains. To go from CART 2 BANK A to CART 2 BANK B, you would first select BANK B, then 1 (or 3, 4, etc.), then select 2. The mod is well worth this small inconvenience, however, since you can now load 16 extra programs into BANK B of the RAM cartridge and double your fun.

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